REMARKS

In order to further conform with the evidence of unexpected results provided in the present application, claims 1, 10 and 19 have been amended to limit the claims to processes utilizing transalkylation catalysts which comprise (i) a first crystalline molecular sieve having a X-ray diffraction pattern including d-spacing maxima at 12.4±0.25, 6.9±0.15, 3.57±0.07 and 3.42±0.07 Angstrom; and (ii) a second crystalline molecular sieve different from the first molecular sieve and selected from zeolite beta and mordenite. Moreover, claims 2 and 15 have been canceled as redundant. Applicants respectfully request entry of this Amendment and reconsideration of this application, as amended.

Rejection Under 35 USC 103(a)

Claims 1-19 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaufman (U.S. Patent No. 3,385,906) in view of Cheng et al (U.S. Patent No. 5,557,024). In particular, the Examiner argues that Kaufman teaches reaction of benzene with propylene in the presence of an alkylation catalyst to produce cumene-containing product from which is separated a majority of cumene. The remaining effluent is combined with benzene and transalkylated over a catalyst such as Zeolite Y. Acknowledging that Kaufman fails to disclose the presently claimed process using a mixture of two different molecular sieves, claim 6's co-extrusion step, or the alkylation catalyst of claim 14, the Examiner relies on the Cheng reference for its disclosure of the use of MCM-22, MCM-49, zeolite Y, zeolite beta and mordenite, including TEA-mordenite, as transalkylation catalysts. According to the Examiner, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the process of Kaufman by utilizing a combination of any two of the transalkylation catalysts disclosed by Cheng because each of these is individually used as transalkylation catalysts. The Examiner further argues i) co-extruding the catalyst as required by present claim 6, would have been obvious given Cheng's disclosure of extrusion as a common method for production of a catalyst, ii) using MCM alkylation catalyst as disclosed by Cheng would have

been obvious to one skilled in the art and iii) one skilled in the art would have utilized small crystal (less than 0.5 micron) TEA-mordenite inasmuch as Cheng discloses its use as a transalkylation catalyst. In response to applicants' arguments that the claimed process produces superior and unexpected results given the data provided in the Examples of the specification, the Examiner has abandoned his earlier argument that the experimental data relied upon by applicants fail to show "superior results." Instead the Examiner now argues the showing made by the experimental data is not commensurate with the scope of the presently claimed invention.

This rejection is respectfully traversed and reconsideration is requested.

Applicants have amended the present claims to delete reference to zeolite Y. Kaufman teaches the use of zeolites such as faujasite, and zeolites L and Y, in transalkylation of benzene and by-products of benzene alkylation with propylene, but fails to disclose or suggest any of the presently claimed molecular sieves, much less the specific combinations of MCM-22 type material and zeolite beta or MCM-22 type material and mordenite, to which the present claims are now limited. Accordingly, it is respectfully submitted that one skilled in the art acquainted with Kaufman and Cheng (which also fails to suggest or disclose the present combinations of molecular sieve for the process now claimed) would not be led to the present invention. Moreover, neither of these references teaches or suggests the unexpected improvements obtained by the combinations of molecular sieves in the process of the invention now claimed.

Moreover, applicants respectfully submit that the present claims, by excluding zeolite Y as a necessary element, are now commensurate in scope with that subject matter shown to provide unexpected results in the Examples. It is unexpected that (a) a mixture of MCM-22 and mordenite would exhibit an advantageous combination of high diisopropylbenzene conversion activity, high cumene selectivity and low ethylbenzene and n-propylbenzene selectivity as compared with each of the catalysts on its own, and (b) a mixture of MCM-22 and zeolite beta would exhibit an advantageous combination of high diisopropylbenzene conversion activity, high cumene selectivity and low

ethylbenzene, 2, 2-diphenylpropane and n-propylbenzene selectivity as compared with each of the catalysts on its own.

Accordingly, it is respectfully urged that the Examiner withdraw this rejection in view of the surprising results of the presently claimed subject matter and the newly reduced scope of the present claims to conform with the data presented in support of patentability. Allowance of the present claims is therefore respectfully requested.

Applicants have not limited the first crystalline molecular sieve in their claims 1, 10 and 19 to MCM-22 even though that is the only molecular sieve exemplified. Applicants respectfully submit that additional data demonstrating the advantage of MCM-36, MCM-49 and MCM-56 are not necessary to support the patentability of these molecular sieves in the process of the invention in view of the following remarks.

MCM-36 is disclosed in U.S. Patent No. 5,250,277 (see the specification at page 7, line 23). As discussed in column 7, lines 7-21 and column 10, lines 22-32 of the '277 patent, MCM-36 is obtained by swelling and pillaring as-synthesized, but uncalcined, MCM-22. Moreover, MCM-49 is disclosed in U.S. Patent No. 5,236,575 (see the specification at page 7, line 23). As disclosed in column 3, lines 64-68 of the '575 patent, "[i]n its calcined form, the crystalline MCM-49 material of the invention transforms to a single crystal phase with little or no detectable impurity crystal phases having an X-ray diffraction pattern which is not readily distinguished from that of MCM-22." Similarly, MCM-56 is disclosed in U.S. Patent No. 5,362,697 (see the specification at page 7, lines 23 and 24). As discussed in the '697 patent, MCM-56 is produced by interrupting the synthesis of MCM-49 (see column 9, lines 10-20) and is similar to MCM-22 and MCM-49 (see column 6, lines 58-59).

It is clear from the above patents, all of which are noted in the present application, that MCM-22, MCM-36, MCM-49 and MCM-56 are members of a family of molecular sieve materials that have significant similarities in physical structure and chemical properties. It is therefore submitted that evidence of superior performance of one member of this family, namely MCM-22, should be

sufficient to establish patentability of the entire family and hence it is respectfully submitted that the experimental data provided in the present Examples suffice to establish the patentability of the amended claims over the disclosures of Kaufman and Cheng et al.

In view of the foregoing comments, entry of this Amendment and allowance of this application is earnestly solicited.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The following changes are being made to claims 1, 10, and 19:

1. (Twice Amended) A process for producing a monoalkylated aromatic compound comprising the step of contacting a polyalkylated aromatic compound with an alkylatable aromatic compound under at least partial liquid phase conditions and in the presence of a transalkylation catalyst to produce a monoalkylated aromatic compound, wherein the transalkylation catalyst comprises a mixture of at least:

(i) a first crystalline molecular sieve having a X-ray diffraction pattern including d-spacing maxima at 12.4±0.25, 6.9±0.15, 3.57±0.07 and 3.42±0.07 Angstrom; and

(ii) a second crystalline molecular sieve different from the first molecular sieve and selected from zeolite beta[, zeolite Y] and mordenite.

10. (Twice Amended) A process for producing a monoalkylated aromatic compound comprising the steps of:

(a) contacting an alkylatable aromatic compound with an alkylating agent in the presence of an alkylation catalyst to provide a product comprising said monoalkylated aromatic compound and a polyalkylated aromatic compound, and then

(b) contacting the polyalkylated aromatic compound from step (a) with said alkylatable aromatic compound under at least partial liquid phase conditions and in the presence of a transalkylation catalyst to produce a monoalkylated aromatic compound, wherein the transalkylation catalyst comprises a mixture of at least:

(i) a first crystalline molecular sieve having a X-ray diffraction pattern including d-spacing maxima at 12.4±0.25, 6.9±0.15, 3.57±0.07 and 3.42±0.07 Angstrom; and

(ii) a second crystalline molecular sieve different from the first molecular sieve and selected from zeolite beta[, zeolite Y] and mordenite.

19. (Twice Amended) A process for producing cumene comprising the steps of:

(a) contacting benzene with propylene under at least partial liquid phase conditions and in presence of an alkylation catalyst to provide a product comprising cumene and polyisopropylbenzenes, and then

(b) contacting the polyisopropylbenzenes from step (a) with benzene under at least partial liquid phase conditions and in the presence of a transalkylation catalyst to produce further cumene, wherein the transalkylation catalyst comprises a mixture of at least:

(i) a first crystalline molecular sieve having a X-ray diffraction pattern including d-spacing maxima at 12.4±0.25, 6.9±0.15, 3.57±0.07 and 3.42±0.07 Angstrom; and

(ii) a second crystalline molecular sieve different from the first molecular sieve and selected from zeolite beta[, zeolite Y] and mordenite.